Learning in Online Environment

Let's Focus on Emotional Awareness

https://doi.org/10.3991/ijet.v18i04.34887

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Abstract—The study emphasizes personality development, the development of students' emotional intelligence, the facilitation of learning (the creation of an atmosphere that stimulates learning), when it seeks the answer to "how, when and why will a student learn, and how will the learning look and feel from the inside". Research conducted among the students at the Milton Friedman University will be presented, regarding how they think about motivation, how their personality traits influence their learning activities, what their learning strategy is and based on all this, how they evaluate the methodological base of teaching tools that support their learning.

Keywords—motivation, emotional intelligence, personality development, learning style, game-based learning, learning environment

1 Introduction

The mechanism of human learning is very complex, and measuring its effectiveness requires a very careful analysis. In previous years, many educational researchers analysed and evaluated the learning process and the effectiveness of learning by focusing on the students' mental state, it has now become almost common to analyse the effectiveness of learning as a function of emotional intelligence, indicating that the emotional state of students can no less influence the effectiveness of learning [3, 9, 2].

The emotional state is related to the student's motivation, the task of education is to create the learning environment that encourages the student to learn [7, 24]. A learning environment must be created that arouses the student's interest and enhances the aesthetic experience of learning. In the digital space, there are many possibilities for this: we can use serious digital games to arouse interest, we can increase students' curiosity with diverse teaching tools, the tasteful colour scheme of the learning environment or images of events [5, 8, 15, 21].

In the digital space, the methods of imparting and acquiring knowledge can be different in terms of the interactions between the teacher and the students: the relationship between them can be realized in virtual classrooms in a "real-time" "face to face" relationship, or the students are just spectators of an online event, lecture, workshop,

or they study exclusively from e-books with individual schedules [17, 22]. Regardless of the method, the instructor must be prepared for these situations, "has to map every student" to get the most out of the teaching-learning process.

How can "to map the students"? It is necessary to get to know the students' learning style [6], to create a learning environment where learning is a joy, where every student can find a form of learning that suits their individual abilities. With good pedagogy, empathy and consideration of individual needs and abilities, the instructor can do a lot to make the students feel good while learning, so that they can learn in an ideal learning environment. The creation of a digital environment that motivates learning is therefore a key issue, since even the best curriculum and the most high-quality training cannot achieve its goal in the absence of a desire to learn. Several studies confirm the close relationship between the motivational background and student performance and learning success: the stronger the motivation, the more effective the learning will be. The research of recent years also makes it clear that learning motivation also plays a decisive role in personality development [16, 4].

To strengthen learning motivation, it is necessary to know the individual learning style of the students and the instructor must develop the teaching methodology based on it. Basically, learning does not depend on the ability to learn, but mainly on the emotional state of the student, on the one hand, on his attitude towards learning in the given situation, on the other hand, on the effectiveness of learning management, on what kind of strategy the instructor has for "addressing" the student, learning to stimulate his desire. The instructor must be authentic. Only in that case can be expected from students to express their feelings and thoughts, to participate in the process in a creative way, if the teacher behaves in the same way.

2 Conditions for effective learning

Learning can only be effective if the student knows exactly the individual moments of the learning process, recognizes himself in the learning process, is able to articulate what motivates him to learn, what his goal is with learning, while recognizing the external world that surrounds him, which is guided by action and decision-making. The triple structure – "thinking (knowledge, knowledge acquisition)", "feeling (intuition helping to practice knowledge)", "volition (problem solving)" – collects and processes all the information that drives and maintains the learning process.

The triple structure of "thinking-feeling-volition" is the condition for the effective functioning of the learning/acquainting process. Rudolf Steiner – Polymath, Doctor of Philosophy, one of the significant thinkers of the 19th–20th centuries – tells us that "all human activity falls within the threesome of thinking, feeling and willing". If the elements of the structure are logically connected, the collection and processing of information will be effective, otherwise dysfunctions will occur, the consequence of which may even be the interruption of the learning process.

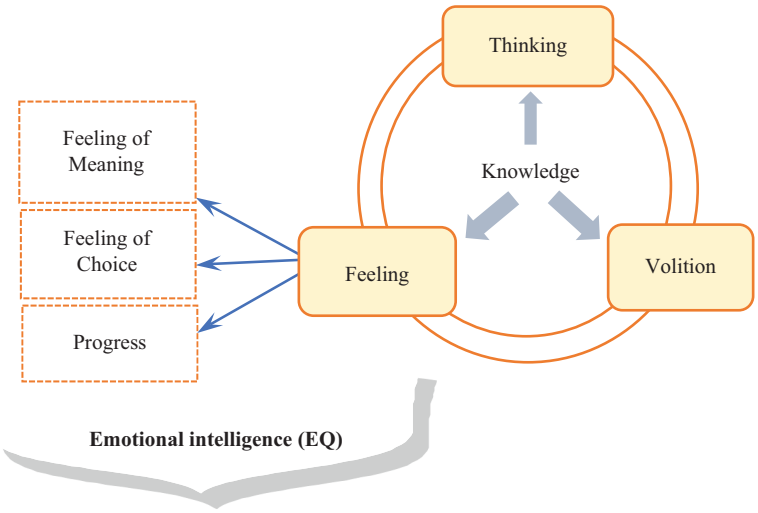

Fig. 1. Intrinsic motivation and effective learning

The structure draws attention to the fact that the students' emotional intelligence and the ability to "attune" to learning play a prominent role during online learning. To achieve this, they must be enabled to actively contribute to the learning experience. Instead of telling them what to learn, we should offer them free choice in the knowledge material. Each student must be allowed to manage his or her own learning. Training can only be effective if the educational program meets the learning needs of the students [23, 1, 20].

The instructor must get to know and understand the inner world and personal learning motivations of each student [13]. The teaching-learning process must be managed in such a way that the students experience the feelings that will motivate them internally, so learning itself becomes a motivation for them. These feelings are a sense of meaningfulness, a sense of choice and a sense of progress, the presence of which improves students' ability to concentrate, makes them think positively, and makes them persistent and committed to learning.

The "feeling of meaning" means that the students are aware of what is important to them, that they have a vision for the future and that they have specific tasks related to it. The instructor must strive to incorporate meaningfulness-enhancing tasks into the curriculum [19].

The "feeling of choice", the student's decision among the methods of processing the knowledge material or the methods of exams and assessment. The possibility of choice relieves stress and reduces the "fear of learning", which is a prerequisite for learning success. The teacher's task is to set relevant and achievable goals for the students. You should design a grading system that considers individual student preferences but does not compare students. Successful task solving strengthens students' self-confidence and increases their desire to learn [19].

"Progress" refers to the student's developmental levels, to the fact that he/she has advanced in the learning-teaching process, crossed a milestone, and for him/her, a unit of study material has been completed. Achieving milestones has a strong motivating effect, it increases the desire to learn, and further progress in learning. Experience shows that rewarding the achievement of milestones increases student enthusiasm. Developing a reward strategy is a serious pedagogical task [19].

3 Methodological solutions of information transfer in digital environment

3.1 Learning styles, students' learning preferences

During the development of the training program, attention must be paid to the method of information transfer, an effort must be made to present the knowledge material in a variety of ways, the basic condition of which is to know the students' preferred learning style.

During the planning of the learning environment, the questions arise: What learning styles exist? How can these be recognized? What is the best teaching model for the students?

The answer to these questions is not simple, because there are many different theories of learning styles [12, 10] and because learning styles change/can change over time or depending on circumstances, just as our work and life change. Since there is a lot of evidence that everyone has a preferred way of acquiring information, it is worth addressing this issue of learning methodology. In this study, Honey and Mumford's model of learning styles is presented [10,11], which for years has been supporting my educational work, has been providing useful assistance for me in digital curriculum development.

According to the model, there are four basic learning styles: Activist, Reflector, Theorist, and Pragmatist.

"Active learners" like company, like to be the centre of attention, and need to discuss learning concepts. They are always ready for action, always open to acquiring new theoretical and practical knowledge. They are enthusiastic about every new idea, and find their joy in long, precise work. They don't like to learn from books, they struggle to get through lengthy written teaching materials. Typically, they learn in a kinaesthetic way, through movement, and they like training exercises and role-playing. Sensory-perceptual (sensory or perceptual) learning is preferred. They learn in an interactive way, their learning results must be immediately evaluated orally or in writing, and immediate feedback positively supports this type of student.

"Reflectors" like to think a lot, whether they are solving theoretical or practical tasks. ("Thinking students" like to think a lot, either solving theoretical or practical tasks) They love learning lonely, on traditional way, from printed books. Information is noted and written down while processing and memorizing it. They are happy to compare the viewpoints and professional opinions of different instructors, and often analyse entire sets of data in detail for decision-making. They like to find out in detail, through

several channels, before acting. They keep their distance and are calm. They are confident, but not enthusiastic.

"Theorists" are a constant observer, and his acquisition of knowledge is effective in a visual way. They try to incorporate all new theoretical knowledge into their own system. They carefully consider and integrates the problems step by step. They strive for perfection, they like to think in terms of models, but they are not really interested in implementation. They like analysis and synthesis. It prefers objective reality over subjective things. It is consistent, it rejects everything that does not fit into its own logical system. They like to argue and can only be convinced by reasoned arguments. They easily learn the logically structured curriculum, but finds it difficult to learn disorganized, descriptive knowledge.

"Pragmatist learners" are happy to try out all theoretical knowledge in practice. They like to experiment, they draw their new knowledge from practice, and their knowledge acquisition is effective through experience. Basic life knowledge is only of interest if it is of practical use. They do not like to think about problems of principle, makes decisions quickly and easily. They are extreme in learning, just adequate in theoretical derivations and explanations, but excellent in practical work.

It is important to note that although individual basic learning styles cannot be categorically separated, it is necessary to learn about students' learning preferences for several reasons. During the methodological structure of the knowledge material of the given training program, one must strive to ensure that everyone in the group finds the most suitable learning methods and tools to benefit as much as possible from the training [14]. It is only possible to build the learning environment in accordance with the students' needs by knowing the learning styles. The effectiveness of learning increases if the instructor assesses the learning style of the students enrolled in the course at the start of each course and accordingly plans the learning paths and the knowledge acquisition methodology accordingly. In the case of courses with many students, it is essential to know the learning preferences of the students to divide them into groups. Grouping based on learning style can increase the effectiveness of learning many times over.

3.2 The learning method that best suits each learning style

Experience shows that learning in the digital space depends much more on the emotional state of the students, on the ability to tune in to learning in a given situation, than on personal intellectual abilities, previous learning successes and experiences, or time structure characteristics.

Learning achieves its goal when knowledge is permanently fixed. To achieve this, we need to find motivational tools that cover the entire learning process and that continuously maintain interest and the need to acquire new knowledge.

From the teaching side, it is necessary to strive for the development of individual talents and skills, students must be presented with the achievement of high but achievable learning goals and milestones, otherwise the "failure experience" of lower-status students will be very decisive, their motivation for learning will significantly decrease or may cease.

The teacher is expected to create a learning environment in which each student can experience the meaning of learning, which gives freedom of choice in the method and toolkit of knowledge acquisition, which rewards progress in learning, in which learning itself is the student's internal motivator.

4 Research: Examining the motivational power of the teaching-learning environment through the eyes of students

My research goal is not to establish a general diagnosis of learning motivation, but rather to examine the content and methodological structure of my e-learning tools through the "eyes" of the students. I wanted to find out how students think about motivation, how their personality traits influence their learning activities, what their learning strategy is like and how well all of this meets the methodological solutions used in my self-developed e-learning tools (than e-books, video-lectures, videogames, educational games, virtual classrooms), and with my ideas about independent learning.

The basic assumption of my research was that the online teaching-learning process is strongly influenced by students' emotional intelligence, that students' learning motivation increases because of "success experiences", that social motives are the determining factors of learning performance.

4.1 Brief description of the research

Research methodology and sampling. To examine the effectiveness of e-learning, I used a questionnaire measuring tool developed in previous years for the purpose of analysing the methodology of self-developed e-books [18]. Regarding the sampling, I did not strive for representativeness, the purpose of the study does not justify it, I only asked the students to classify themselves into one of the three test groups I set up (see Table 1) before answering the questions and statements. The instructions were to not weigh their answers, there are no right or wrong answers, and to make decisions based on first impressions.

The students participating in the study are students at Milton Friedman University, who in the given semester took each of the advertised accounting courses according to the curriculum and to whom I offered the option of completing the course digitally as an alternative. I divided the students – based on their personal decision – into 3 control groups.

- **Interactive:** students registered for courses advertised on the Moodle Platform used for e-education, whose learning process and performance could be continuously monitored, followed the learning paths in cooperation with the instructor.
- **Introverts:** students registered for courses advertised on the Moodle Platform used for e-learning, who studied without cooperation with the instructor. In the absence of feedback, their performance during the semester was unknown.
- **Traditionalists:** students who are not enrolled in e-courses and study in the traditional way.

A total of 150 students took part in the survey, most respondents (58.90%) were registered on the portal and were from the group of students who constantly require teacher cooperation. 20 of the unregistered students filled out the questionnaire (13.33%). The composition of the sample is shown in Table 1.

Table 1. Participants of the survey (number of students)

Groups Characteristics	Interactives	Introverts	Traditionalists	Total
Registered, who learned with teacher cooperation	94	–		**94**
Registered, who learned without teacher cooperation		36		**36**
Not registered, who learned on the way traditional	–	–	20	**20**
Total	**94**	**36**	**20**	**150**

The content of the questionnaire, the theoretical background of the research. The questionnaire included a total of 68 statements (variables), which were grouped around three main topics – personal motives, learning freedom, learning motivation. When evaluating the questionnaire, I compiled the three subtests based on the three topics, along which I conducted the research with "factor analysis".

4.2 Presentation of the research based on the subtests

FIRST SUBTEST: *The role of personal motives in independent learning*

During the investigation, I focused on those personal characteristics that show a close connection with the students' self-confidence and self-esteem. I was looking for the answer to what role personality traits play in learning, how they influence the choice of a learning strategy, what effect they have on learning motivation and the effectiveness of learning.

The subtest included a total of 28 statements, based on which I formed five major factors – conscientiousness, friendliness, sociability, emotional stability, impulsivity. The validity of the statements was evaluated by the students on a five-point scale – 1-not typical, 5-completely typical – in relation to themselves. I summarized the results of the "Personal motives" subtest in Table 2.

Table 2. Factor analysis of personal motives

Factors	Groups		
	Interactives	Introverts	Traditionalists
Conscientiousness	4.46	4.12	4.02
Geniality/Friendliness	4.38	3.02	3.34
Sociability	4.22	3.36	2.53
Emotional stability	4.54	4.24	3.54
Impulsivity	4.72	3.54	3.74

The numerical results show that the interactive students rated themselves better than their peers in the other two groups in terms of all five factors.

To diagnose the differences between Interactives and Introverts and formulate the reasons for the differences, I quantified the difference in the personal marks of the two groups, the value of which was given in %. Based on the self-evaluation, I considered an interactive group with better personality traits as the base group. (Table 3)

Table 3. Differences in personal motives among registered students

Factors	Interactives	Introverts	Difference
	Base Group		
Conscientiousness	90.6%	84.2%	+6.4%
Geniality	88.8%	**61.9%**	**+26.9%**
Sociability	85.1%	68.9%	+16.2%
Emotional stability	92.2%	85.9%	+6.3%
Impulsivity	**95.5%**	71.9%	**+24.1%**

It can be concluded that there is no significant difference in emotional stability and conscientiousness between the two groups, which is not surprising, as the students of both groups are registered Moodle users, committed to online learning, conscientious, and able to achieve their goals without external control or guidance. Between the students of the two groups, there is a more significant difference between the factors of impulsivity and friendliness: interactive students consider themselves strong-willed, practical, who like challenges and bravely take risks.

SECOND SUBTEST: Learning freedom in self-study

In connection with the examination of learning freedom, I asked the students about the choice of learning strategy, learning style, learning environment, persistence, effort, and organization of the learning process.

My goal was to prove that the students became aware that the content of knowledge has now become more valuable, the development of skill-based components of knowledge has come to the fore, and that learning is useful, applicable in practice, and competitive, which is natural learning controlled by the individual. My goal was also to prove that all of these are linearly related to the students' exam results.

In the first step of the factor analysis, I separated three major factors: natural/real learning, self-organizing learning, and school learning factors.

I defined the characteristic features of each factor – without claiming to be complete – as follows:

a) Characteristics of the factor of natural/real learning

- students learn important, new information and attitudes unnoticed
- students share different values and beliefs without noticing.
- it takes place in a learning environment where students gain as much knowledge as possible based on their own experience, where learning is a joy.
- in its creation, individual experience, experience, and action are decisive.
- the learning process is internally motivated

b) Characteristics of the factor of self-organized learning

- intentional learning, completely dependent on the student's will,
- always has some specific content, purpose, function
- the student plans, organizes, acts, performs self-evaluation
- the student selects, structures, and shapes his learning environment (physical, social environment)
- the learning process is internally motivated, driven by the student's personal goals

c) Characteristics of the school learning factor

- bound, teacher-initiated and guided learning
- compulsory learning independent of the student's will
- learning in a school situation at a specific time
- the process followed and evaluated by the teacher
- the learning process is mostly externally motivated

Based on the analysis of the results of the "Learning freedom" subtest, I performed the factor analysis, the summary results of which are summarized in Table 4.

Table 4. Factor analysis of learning freedom

Factors	Groups		
	Interactives	**Introverts**	**Traditionalists**
Natural/real learning	4.75	3.27	2.65
Self-organized learning	4.30	4.65	2.00
Organized/school learning	2.40	2.27	3.65

The results show that almost all the interactive students have the signs of real learning, while in the case of introverts, the signs of self-organized learning appear more clearly. Both groups reject organized learning and instead prefer independent learning.

To diagnose the differences between Interactives and Introverts, I formed new factors based on the variables of the questionnaire, approaching from a different perspective. These are the learning environment, concentration, memory, self-regulation skills, learning experience. Table 5 shows the summary of the test results.

Table 5. Factor analysis of study freedom among registered students

Factors	Groups	
	Interactives	**Introverts**
Learning environment	3.59	3.00
Concentration	2.49	2.25
Memory	4.91	4.80
Self-regulatory ability	3.29	3.16
Learning experience	**4.70**	3.00

The results show that the most significant difference in terms of learning freedom between the two groups of students who voted for independent learning is the need for cooperation with peers:

– Interactive students require a social learning environment, introverts tend to reject it.
– The learning concentration of interactive students is not disturbed by their peers, while introverts are disturbed by the inquisitive questions of their peers from the learning process
– Interactives require competition with their peers, Introverts are/can be made passive by the awareness of falling behind their peers
– Interactive people consider practical, "reality-tasks" to be the measure of knowledge, they consider it important to measure abilities, while Introverts are uncertain, it is clear from their answers that they consider the middle way of assessing practical and lexical knowledge to be a good solution

THIRD SUBTEST: Examining learning motivation in self-study

Since – according to my assumption – social factors play a decisive role in the independent learning process, they appear accordingly as a defining aspect of the motivational process, therefore the questions about the students' social status and interpersonal relationships were emphasized in the study motivation questionnaire.

When compiling the questions, I focused on one part whether the students confirm my hypothesis that the social motivation of the students increases in the independent learning process because of learning success, and on the other hand, I also looked for an answer to the question of how the students feel about theoretical and practical knowledge about the stimulating effect of his learning.

The subtest contained a total of 30 statements, based on the variables – for the purpose of factor analysis – I separated five larger factors: interest (desire to know), recognition/reward, self-efficacy (desire for success, fear of failure), methods/game-based learning, external compliance.

I summarized the summary results of the factor analysis in Table 6. I ranked the factors based on the average values of the individual factors. The factor with the greatest motivational power was given the number 1, the smallest the number 5.

Table 6. Summary of the results of the factor analysis

Factors	**Groups**			**Total**	**Ranking**
	Interactives	**Introverts**	**Traditionalists**		
Interest	*4.46*	*4.14*	*4.00*	*4.20*	*4*
Recognition/reward	4.57	4.38	4.36	**4.43**	**2**
Self-efficacy	4.62	4.22	4.11	**4.28**	**3**
Methods/game-based learning	4.46	4.71	4.60	**4.58**	**1**
External compliance	4.16	4.00	4.15	**4.10**	**5**

From the summary of the results, the score given to the teaching method is outstanding. The questions of the questionnaire were typically related to the perception and methods of game-based learning, which received a high score for each group. All of this confirms that students expect high-quality demonstrations, the use of high-quality educational technology tools appropriate to the subject, that adults also like to play, and demand playful lessons and playful tasks built into the curriculum, which should strongly encourage teachers to develop methods.

5 Summary

Table 7 contains the distribution (average) of the factors broken down into the 3 investigated groups, while Figure 2 shows this distribution with the average of the subtests.

Table 7. Distribution of the factors of the subtests by group

Part Tests and Factors		Interactive	Introverts	Traditionalists
Personal motives	Conscientiousness	4.46	4.12	4.02
	Geniality/Friendliness	4.38	3.02	3.34
	Sociability	4.22	3.36	2.53
	Emotional stability	4.54	4.24	3.54
	Impulsivity	4.72	3.54	3.74
	Total	**4.464**	**3.656**	**3.434**
Learning freedom	Natural/real learning	4.75	3.27	2.65
	Self-organized learning	4.30	4.65	2.00
	Organized/school learning	2.40	2.27	3.65
	Total	**3.816**	**3.396**	**2.766**
Learning motivation	Interest	4.46	4.14	4.00
	Recognition/reward	4.57	4.38	4.36
	Self-efficacy	4.62	4.22	4.11
	Methods/game-based learning	4.46	4.71	4.60
	External compliance	4.16	4.00	4.15
	Total	**4.542**	**4.290**	**4.244**

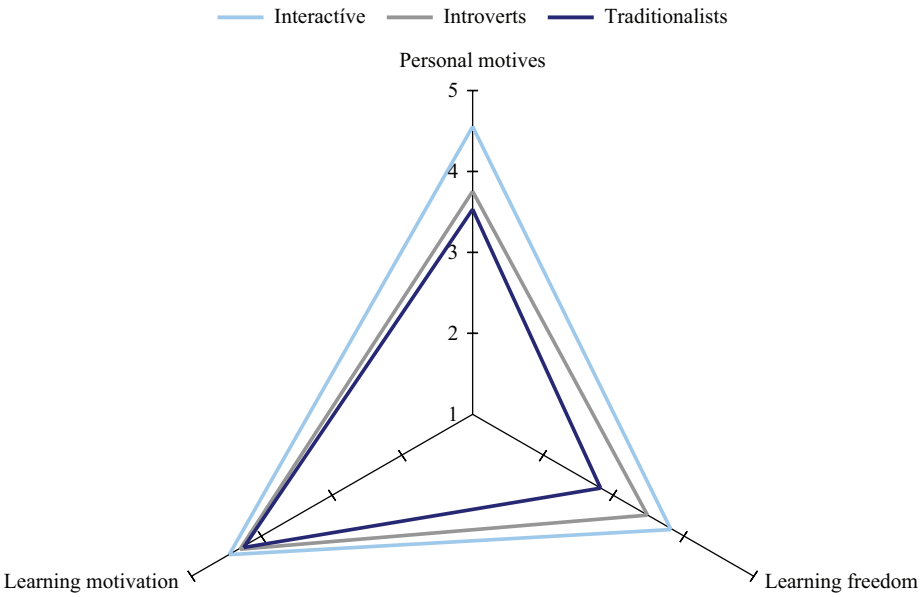

Fig. 2. Averages of subtests per group

At the end of the research, I compared the traditional exam results of the students of the three control groups in five different accounting subject courses, which are presented in Table 8 per course and in aggregate, while Figure 3 shows the results of the subtests in the light of the exam results.

Table 8. Traditional exam results per course and group

Groups	Exam Results Per Course					Total
	1	2	3	4	5	
Interactive	4.80	3.90	4.85	4.70	3.50	**4.35**
Introverts	4.30	3.50	3.80	4.50	3.30	**3.88**
Traditionalists	2.00	3.20	3.00	3.50	3.00	**2.94**

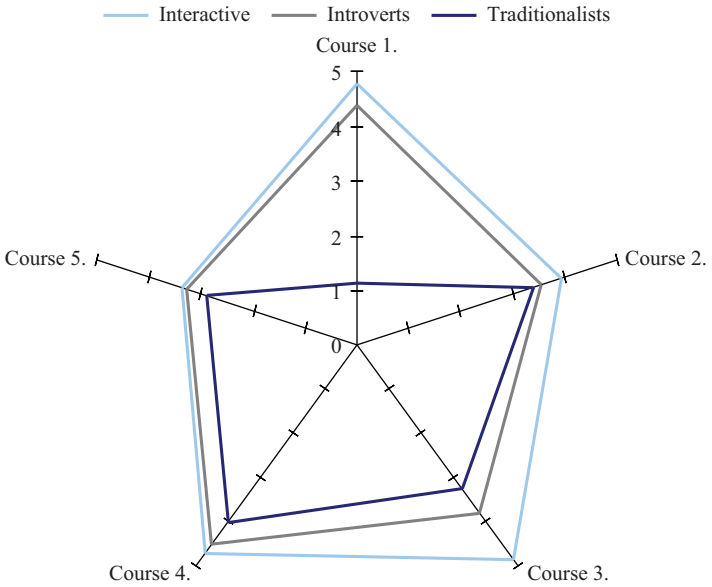

Fig. 3. Personal characteristics, learning freedom and learning motivation in the light of academic average

The results show that personal motives determine the learning process: conscientious students are more persistent, use more self-organized learning techniques, can manage their study time more efficiently, are internally motivated, which is reflected in their excellent academic results.

We see the strongest correlation between the different groups in the case of learning motivation, regardless of which group they belong to, all students show the same willingness to acquire knowledge. (Figure 3) In terms of learning freedom and personal motives, we experience greater differences in the case of each group. These differences are the cause of the differences in the academic results achieved what is shown in Figure 3.

Among the personal characteristics, the factors of friendliness and sociability have the least significant relationship, while conscientiousness and emotional stability show a significant relationship with most factors.

I found that students are significantly influenced by social-emotional factors during their learning activities: the teacher-student, student-student relationship, belonging, emotional warmth, emotional attachment enrich the students' professional intelligence

Social factors, such as the need for emotional warmth, recognition from the teacher and peers, and the need to belong to peers are prioritized in the motivational structure of interactive students. For introverted students, the motivational value of social-emotional factors is lower: for these students, independence from the environment, peers, and the teacher dominates the learning process, the cause of which is the fear of failure.

6 Conclusion

The main message of the study is that it is worthwhile to deal with the development of students on a personality basis, that the issue of emotional awareness is unavoidable in education, it is an important factor in the success of learning. We can support students with a customized development plan as efficiently as possible in the teaching-learning process, because this is the best way to deal with learning anxiety and stressful situations.

The first step in developing a personalized development plan is to get to know the students' learning style, which makes it clear to the instructor what methodology he should base the knowledge on. The key question of successful education is "how to teach", which does not mean that "what to teach" is less important, but rather indicates that the instructor must have specific pedagogical competencies in addition to the expected subject-specific knowledge.

The task of the school is to teach students to live with different emotions, to deal with different emotions appropriately, and to develop emotional awareness. Emotional awareness affects the success of learning to a much greater extent than we think. By getting to know our emotional functioning better in the learning process, the emotional background, and aspects of the learning process, we can be more successful in almost all areas of life, and we can handle.

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Article submitted 2022-08-24. Resubmitted 2022-11-14. Final acceptance 2022-11-14. Final version published as submitted by the authors.